

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The final Office Action dated June 23, 2006 and the Advisory Action dated October 16, 2006, have been received and their contents carefully reviewed. Applicants appreciate the indication by the Examiner that claim 21 is allowed.

Claims 1-9, 11-20 and 22-42 are rejected by the Examiner. With this response, claim 1, 5, 8, 9, 11 and 29 have been amended. Claims 13, 14, 17, 30, and 43 have been canceled without prejudice or disclaimer. No new matter has been added. Claims 1-9 and 11, 12, 15, 16, 18-29 and 31-42 remain pending in this application.

In the Office Action, claims 1-13, 15, 16, 18-20, 22-24 and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' Related Art (ARA) in view of U.S. Publication No. 2005/0018108 (hereinafter '108'). Claims 14, 17, 25-28 and 30-42 are rejected under 35 U.S.C. § 103(a) as being unpatentable over ARA in view of '108 and further in view of U.S. Patent No. 5,777,707 (hereinafter '707'), U.S. Patent No. 5,757,452 (hereinafter '452'), U.S. Patent No. 5,642,176 (hereinafter '176'), U.S. Patent No. 5,142,392 (hereinafter '392') and U.S. Patent No. 6,707,067 (hereinafter '067').

The rejection of claims 1-9, 11, 12, 15, 16, 18-20, 22-24 and 29 under 35 U.S.C. § 103(a) as being unpatentable over Applicants' Related Art (hereinafter 'ARA') in view of U.S. Publication No. 2005/0018108 (hereinafter '108') is respectfully traversed and reconsideration is requested. Claim 10 has been previously cancelled without disclaimer or prejudice and Applicants submit that the rejection to claim 10 is moot.

Claim 1 recites an in-plane switching liquid crystal display device having a combination of features including "wherein the R, G, B, and W subpixels of each pixel are arranged in a zigzag pattern in a data line direction, and each of R, G, B, and W subpixels of a pixel is arranged to be symmetric with respect to the gate line to R, G, B, and W subpixels of the same color of an adjacent pixel of the plurality of pixels, and wherein each W subpixel is not adjacent to another W subpixel."

Applicants submit that Applicants' related art does not teach at least "subpixels of each pixel arranged in a zigzag pattern in a data line direction." For example, FIG. 3 shows subpixels arranged in a linear arrangement along a gate line. The Examiner cites paragraph [0016] of '108 as teaching that it was conventional to use dedicated white pixels. Applicants do not reach the

Examiner's conclusion regarding the teachings of '108. Applicants submit that '108 does not cure the deficiencies in the teachings of ARA with respect to "wherein the R, G, B, and W subpixels of each pixel are arranged in a zigzag pattern in a data line direction" as recited in claim 1.

Applicants further submit that ARA does not teach "pixels each including R (Red), G (Green), B (Blue) and W (White) subpixels" and "wherein each W subpixel is not adjacent to another W subpixel," as recited in claim 1. Applicants first submit that ARA does not teach using W subpixels. To arrive at a configuration having non-adjacent white pixels, the Examiner proposes adding a single white pixel to the arrangement shown in FIG. 3 of the Applicants' specification stating, "figure 3 clearly shows R, G, and B sequence, and adding a white pixel would add another element to the sequence but the sequence would only be altered to accommodate the white pixel." Applicants note that adding a W subpixel to only one of the two pixels would not result in the pixels "each including R (Red), G (Green), B (Blue) and W (White) subpixels." Accordingly, Applicants respectfully submit that '108 does not cure the deficiency in the teachings of ARA with respect to the above-identified combination of elements.

Applicants submit that as ARA and '108, analyzed singly or in combination do not teach each and every element of claim 1 for at least the reasons given above, claim 1, and claims 2-7 depending from claim 1 are allowable over ARA and '108.

Claim 8 recites an in-plane switching mode liquid crystal display device having a combination of features including "wherein the R, G, B, and W subpixels of each pixel are arranged in a zigzag pattern in a data line direction, the subpixels having the same color of adjacent pixels being arranged in a different direction to compensate a main viewing angle of each of R, G, B, W subpixels.

Applicants submit that Applicants' related art does not teach at least "wherein the R, G, B, and W subpixels of each pixel are arranged in a zigzag pattern in a data line direction." For example, FIG. 3 shows subpixels arranged in a linear arrangement along a gate line. The Examiner cites paragraph [0016] of '108 as teaching that it was conventional to use dedicated white pixels. Applicants do not reach the Examiner's conclusion regarding the teachings of '108. Applicants submit that '108 does not cure the deficiencies in the teachings of ARA with respect to "wherein the R, G, B, and W subpixels of each pixel are arranged in a zigzag pattern in a data line direction, the subpixels having the same color of adjacent pixels being arranged in a

different direction to compensate a main viewing angle of each of R, G, B, W subpixels.”

Applicants submit that as ARA and ‘108, analyzed singly or in combination do not teach each and every element of claim 8 for at least the reasons given above, that claim 8, and claims 9 depending from claim 8 are allowable over ARA and ‘108.

Claim 11 recites an in-plane switching liquid crystal display device having a combination of features including “a first set of pixels of different colors, each of the pixels having a data line along a side thereof and a gate line along a side thereof, wherein one of the pixels is a white (W) pixel” and “a second set of pixels of different colors, each of the pixels having a data line along a side thereof and a gate line along a side thereof, wherein one of the pixels is a white (W) pixel” and “wherein the first set of pixels and the second set of pixels are adjacent to each other and wherein the white pixel of the first set and the white pixel of the second set are not adjacent to each other.” Applicants respectfully submit that ARA and ‘108 fail to teach the above-identified features of claim 11.

In rejecting claim 11, the Examiner cites FIG. 3 of ARA as teaching “wherein the white pixel of the first set and the white pixel of the second set are not adjacent to each other.” Applicants submit that as ARA is silent about the location of the white pixels. For Example FIG. 3 cited by the Examiner teaches two adjacent horizontal sets of pixels having no white pixel.

As allegedly curing the deficiencies in the teachings of ARA, the Examiner cites paragraph [0016] of ‘108 as teaching that it was “well known or conventional to use dedicated white pixels” and states that as FIG. 3 of ARA “clearly shows a R, G, B, sequence adding a W pixel would add another element to the sequence, but the sequence would only be altered to add the white pixel. Applicants note that adding a single white pixel as suggested by the Examiner would not result in “a second set of pixels of different colors, each of the pixels having a data line along a side thereof and a gate line along a side thereof, wherein one of the pixels is a white (W) pixel” as recited by claim 11. Applicants further submit that adding a second W pixel to the second set would result in the W pixels being vertically adjacent contrary to the requirement that “the white pixel of the first set and the white pixel of the second set are not adjacent to each other” as recited in claim 11. Applicants respectfully submit that no combination of ARA and ‘108, analyzed singly or in combination teaches the combination recited in claim 11. Accordingly, Applicants submit that claim 11 and claims 12, 15, 16, 18-20 and 22-24 depending from claim 11 are each allowable over ARA and ‘108 for at least this reason.

Claim 11 further recites “wherein the white pixel of the first set and the white pixel of the second set are not adjacent to each other, and wherein the first set of four pixels and the second set of four pixels are each arranged in a two by two matrix and wherein the pair of electrodes of pixels in the first set are in a direction from and symmetric about a line perpendicular to the gate line from the pair of electrodes of pixels of the same color in the second set.” Applicants submit that this element is not taught by ARA or ‘108 analyzed singly or in combination as the references do not teach at least a two by two matrix of pixels where the pixels are “pixels of different colors.” Accordingly, Applicants submit that claim 11 and claims 12, 15, 16, 18-20 and 22-24 depending from claim 11 are allowable over ARA and ‘108 for at least this additional reason.

Claim 29 as recites an in-plane switching mode liquid crystal display device having a combination of features including “a first set of pixels of different colors, each of the pixels having a data line along a side thereof and a gate line along a side thereof, wherein one of the pixels is a white (W) pixel; a second set of pixels of different colors, each of the pixels having a data line along a side thereof and a gate line along a side thereof, wherein one of the pixels is a white (W) pixel; a third set of pixels of different colors, each of the pixels having a data line along a side thereof and a gate line along a side thereof, wherein one of the pixels is a white (W) pixel; and a fourth set of pixels of different colors, each of the pixels having a data line along a side thereof and a gate line along a side thereof, wherein one of the pixels is a white (W) pixel; wherein the white pixels are not adjacent to each other” Applicants submit that ARA and ‘108, analyzed singly or in combination, fail to teach or suggest the above recited elements of claim 29 for reasons similar to those given for claim 11 above. Applicants respectfully submit that claim 29 is allowable over ARA and ‘108 for at least this reason.

Claim 29 additionally recites “wherein the first set of pixels includes four pixels, the second set of pixels includes four pixels, the third set of pixels includes four pixels, and the fourth set of pixels includes four pixels and wherein the first to fourth sets of four pixels are each arranged in a two by two matrix and wherein the each pixel contains a pair of electrodes to form a horizontal electric field and wherein the wherein the pair of electrodes of pixels in the first set are in a direction from and symmetric about a line perpendicular to the gate line from the pair of electrodes of pixels of the same color in the second set.” Applicants submit that ARA and ‘108, analyzed singly or in combination do not teach this combination of features recited in claim 29.

Applicants submit that claim 29 is allowable over ARA and '108 for at least this additional reason.

The rejection of claims 25-28 and 31-42 under 35 U.S.C. § 103(a) as being unpatentable over ARA in view of '108 and further in view of U.S. Patent No. 5,777,707 (hereinafter '707'), U.S. Patent No. 5,757,452 (hereinafter '452'), U.S. Patent No. 5,642,176 (hereinafter '176'), U.S. Patent No. 5,142,392 (hereinafter '392') and U.S. Patent No. 6,707,067 (hereinafter '067') is respectfully traversed and reconsideration is requested.

With respect to claims 25-28, these claims depend from claim 11 and include by reference all of the limitations of claim 11. Claim 11 recites an in-plane switching mode liquid crystal display device having a combination of features including "wherein the white pixel of the first set and the white pixel of the second set are not adjacent to each other, and wherein the first set of four pixels and the second set of four pixels are each arranged in a two by two matrix and wherein the pair of electrodes of pixels in the first set are in a direction from and symmetric about a line perpendicular to the gate line from the pair of electrodes of pixels of the same color in the second set." The Examiner in rejecting claims 14 and 17 states and Applicants agree that "[Applicants' Related Art] in view of '108 ...lacks the white pixel of the first set and the white pixel of the second set not adjacent to each other." To cure this deficiency, the Examiner cites patents '707, '452, '176, '392, and '067 as evidence that arrangements with non adjacent white pixels are well known in the art, and as motivation for modifying the teachings of Applicants' Related Art and '108 states "it would have been obvious to one of ordinary skill at the time of the invention to combine ARA in view of 108 with common knowledge in order to improve the color gamut of the cell." Assuming for the purpose of argument that the cited references do teach a two by two matrix of pixels as recited in claim 11, Applicants submit that arranging the pixels into the structure taught by ARA and '108 would not produce an arrangement "wherein the pair of electrodes of pixels in the first set are in a direction from and symmetric about a line perpendicular to the gate line from the pair of electrodes of pixels of the same color in the second set" as recited by claim 11. Accordingly, Applicants submit that as ARA, '108, and patents '707, '452, '176, '392, and '067, analyzed singly or in combination do not teach the all the elements of claim 11, claim 11, and claims 25-28 depending from claim 11 are each allowable over the cited references.

With respect to claim 29, as discussed above Applicants' Related Art and '108 do not teach or suggest at least "wherein the first set of pixels includes four pixels, the second set of pixels includes four pixels, the third set of pixels includes four pixels, and the fourth set of pixels includes four pixels and wherein the first to fourth sets of four pixels are each arranged in a two by two matrix and wherein each pixel contains a pair of electrodes to form a horizontal electric field and wherein the wherein the pair of electrodes of pixels in the first set are in a direction different from and symmetric about a line perpendicular to the gate line from the pair of electrodes of pixels of the same color in the second set" as recited by claim 29. The Examiner in rejecting claims 14 and 17 states and Applicants agree that "[Applicants' Related Art] in view of '108 ...lacks the white pixel of the first set and the white pixel of the second set not adjacent to each other." To cure this deficiency, the Examiner cites patents '707, '452, '176, '392, and '067 as evidence that arrangements with non adjacent white pixels are well known in the art, and as motivation for modifying the teachings of Applicants' Related Art and '108 states "it would have been obvious to one of ordinary skill at the time of the invention to combine ARA in view of 108 with common knowledge in order to improve the color gamut of the cell." Assuming for the purpose of argument that the cited references do teach a two by two matrix of pixels as recited in claim 29, Applicants submit that arranging the pixels into the structure taught by ARA and '108 would not produce an arrangement "wherein the pair of electrodes of pixels in the first set are in a direction from and symmetric about a line perpendicular to the gate line from the pair of electrodes of pixels of the same color in the second set" as recited by claim 29. Accordingly, Applicants submit that as ARA, '108, and patents '707, '452, '176, '392, and '067, analyzed singly or in combination do not teach the all the elements of claim 29, claim 29, and claims 31-42 depending from claim 29 are each allowable over the cited references.

Applicants believe the above amendments and remarks place application in condition for allowance and early, favorable action is respectfully solicited.


If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. § 1.136, and any additional fees required under 37

C.F.R. § 1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. *A duplicate copy of this sheet is enclosed.*

Respectfully submitted,

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